

later enlarged Sor Juana's English-speaking audience with translations: *Sor Juana Inés de la Cruz: Poems* (Bilingual Press, 1985) and *A Woman of Genius: The Intellectual Autobiography of Sor Juana Inés de la Cruz* (Lime Rock Press, 1982). Ms. Peden, a professor of Spanish at the University of Missouri at Columbia, also translated Mr. Paz's *Sor Juana* for Harvard.

The Sor Juana revival will continue next year, when, for example, as part of its series on Latin American Literature and Culture, Wayne State University Press plans to publish *Toward a Feminist Understanding of Sor Juana Inés de la Cruz*, edited by Stephanie Merrim, an associate professor of Hispanic studies at Brown.

No Access to Formal Education

Ms. Merrim's book will address an issue to which she says Mr. Paz pays insufficient attention—Sor Juana's relation to writing by other women.

Unfold Sisters: Hispanic Nuns in Their Own Works, a literary study of nuns in Spain and in Spanish holdings in the New World during the 16th, 17th, and 18th centuries, will also shed light on that matter. Edited by Ms. Arenal of Staten Island and Stacey Schlau of West Chester University of Pennsylvania, it is scheduled for publication by the University of New Mexico Press in 1989.

The pivotal event, scholars seem to agree, will be the appearance of Mr. Paz's study in tandem with Mr. Trueblood's anthology.

The anthology contains Sor Juana's best works in poetry and in prose—"First Dream" and "Reply to Sor Philothea," respectively—as well as a variety of her other writings, including some excerpts from *The Divine Narcissus*, one of her several plays.

As Mr. Paz shows, those achievements came against considerable odds.

Juana was born out of wedlock, probably in 1648, in a village southeast of the city of Mexico (now Mexico City). At about the age of 10 she was sent to live with an aunt in the city.

By necessity—as a woman, she had no access to a formal education—she was largely self-taught. She nonetheless pro-

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Parapsychologists Fire Back at a National Academy Report That Called Field Unscientific and Experiments Flawed

By DAVID L. WHEELER

Parapsychologists, who investigate such phenomena as extrasensory perception, have fired back at a National Research Council committee that said their field is unscientific and their experiments poorly conducted.

Parapsychologists study psychological phenomena not readily explainable by the existing laws of science. They believe some experiments they frequently conduct demonstrate unexplainable effects that point to the possible existence of telepathy or the power of mind over matter. A report by a National Research Council committee, however, said those experiments had been completely inconclusive and any positive results were due to methodological flaws, or "dirty test tubes."

Parapsychologists consider the reputation of their field and its future support to be at stake and they have been trying to discredit the National Research Council report, "Enhancing Human Performance: Issues, Theories, and Techniques," released last year by the National Academy Press (*The Chronicle*, December 9, 1987). The U.S. Army commissioned the report

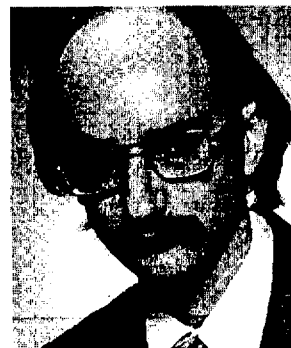
to see if some performance-improvement techniques developed outside the mainstream of science, such as biofeedback, sleep learning, and extrasensory perception, might have some value for soldiers.

'No Scientific Justification'

Not all of the report dealt with parapsychology, but it said there was "no scientific justification from research conducted over a period of 130 years for the existence of parapsychological phenomena."

Dean I. Radin, a research psychologist at Princeton University and the president of the Parapsychological Association, says the parapsychologists expected a somewhat negative report but felt the National Research Council committee had gone to extremes—including the attempted suppression of evidence favorable to parapsychology—to try to debunk parapsychological research.

"Reports like the one by the National Research Council tend to influence people who might be interested in funding this work," says Mr. Radin. "They are not interested in ridicule any more than anyone else is."



Dean I. Radin: "Reports like the one by the National Research Council tend to influence people who might be interested in funding this work."

Ray Hyman, a professor of psychology at the University of Oregon and one of two people on the research council's committee who evaluated parapsychology, describes the parapsychologists' criticisms of the committee's report as "kind of silly."

Some Experiments Worth Following

"The parapsychologists should be rejoicing," he says. "This was the first government committee that said their work should be taken seriously."

The report recommended that the Army continue to "monitor" some parapsychological research and occasionally visit some laboratories, including one at Princeton University. The committee said the research worth following included "Ganzfeld" experiments intended to measure telepathy and experiments in which research subjects try to mentally force a random-number-generating device to emit numbers that are not random.

Mr. Hyman says the parapsychologists

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Universities Urged to Set Clearer Policies on 'Gray Areas' of Scientific Misconduct

WASHINGTON

A group of scientists, journal editors, lawyers, university administrators, and federal policymakers convened by the Institute of Medicine made a series of recommendations last week that could give universities a bigger role in encouraging proper scientific conduct.

A number of reports of scientific fraud this year triggered Congressional investigations of some specific cases and prompted suggestions that the federal government should more actively audit the research it pays for. Scientists who fear such interference in research and who have some concerns of their own about ethics in science

are beginning to re-examine their research practices. Some universities are also taking a new look at their promotion and tenure policies to see if the policies are encouraging rapid-fire publication that could be promoting bad science.

The Institute of Medicine, which is part of the National Academy of Sciences, has put together a committee on scientific responsibility that is preparing a report for the National Institutes of Health. The committee organized last week's workshop, at which speakers expressed widely divergent views on what to do about preventing scientific misconduct—not just the blatant

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RESEARCH NOTES

Bones of the 'Supersaurus'; Superconductivity Advance; Professionals and Part-Time Work



A field worker sketches a fossil that researchers say belongs to the gigantic "Supersaurus" dinosaur.

Researchers from Brigham Young University have unearthed what they say is the largest complex of dinosaur pelvic bones that have ever been discovered.

The massive fossils include several fused vertebrae and the pelvic bones of what was believed to be a plant-eating *Supersaurus* dinosaur.

The Brigham Young researchers estimated that the dinosaur measured 120 feet in length and weighed between 20 and 30 tons when it died some 135 million years ago.

The complex of bones, which measured 73 inches by 52 inches, was uncovered August 18 at Dry Mesa Quarry near Delta, Colo.

Researchers said the new find was important because it would help to set-

tle the debate over how *Supersaurus* was related to a smaller dinosaur known as *Diplodocus*. —KIM A. McDONALD

Superconductor Advance Reported at U. of Arkansas

Two researchers at the University of Arkansas at Fayetteville have reported a safer method of making a thallium-based high-temperature superconductor, a material that, when chilled, is capable of transmitting electricity with no resistance. Thallium, a poisonous element used in rat poisons, appears to be a necessary element in the preparation of superconductors with the most desirable properties.

A thallium-barium-calcium copper

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Parapsychologists Respond to Criticism of Field

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are pushing for acceptance by other researchers too soon. Many parapsychologists are well trained, he says, but are often not following widely accepted standards for experiments. "I think their experiments should be an embarrassment to them," he says. "They need to go back to their laboratories and clean up their act."

The Parapsychological Association, which has about 250 members, has replied to the research council's committee with a 29-page critique of its report.

Large Body of Findings Cited

The critique says the "committee's conclusion far outstrips the scope of its investigation. . . . Parapsychologists have accumulated a large body of experimental findings that (a) suggest important new means of human interaction with their environment and (b) cannot be plausibly attributed to known conventional mechanisms."

In one kind of experiment, cited

both by many parapsychologists and by their critics as being the best work parapsychologists have done, research subjects are placed in a reclining chair in a soundproofed room with "white noise" piped into their ears and goggles or halves of Ping-Pong balls placed over their eyes so they see a uniform field of light. The blandness of their sensory environment puts them into a reportedly pleasant, altered mental state, or "Ganzfeld." Some parapsychologists believe this state makes the research subjects more receptive to telepathic messages.

In a separate room, a researcher selects a videotape or a still picture from a group and shows another research subject an image, which he or she tries to transmit mentally to the person in the Ganzfeld state. After a set time, the "receiver," or person in the Ganzfeld state, is brought out of the state and is shown the same group of videotapes or pictures.

The receivers are asked to pick the image that most closely relates to the

images that were in their mind during the Ganzfeld state. If the receiver picks the image that the sender was shown, it is considered a "hit" or a positive result.

Tests Called Poorly Designed

The experiments vary in their exact design, but Mr. Radin says that, taken as a group, they demonstrate that "information can be transmitted in ways we don't understand yet."

The N.A.C. committee's Mr. Hyman attributes research results indicating telepathy or other paranormal communication to poorly designed experiments. He says that, if paranormal communication is to be proved, experimenters first have to be certain that the selection of images is completely random. No such proof is given in Ganzfeld experiments, he says, and poor methods of randomly selecting an image are used, such as hand shuffling.

He also says the experimenters should use two sets of the same images—be they still pictures or video-

tapes—so the "sender" cannot mark the picture in a way a "receiver" might notice. Mr. Hyman says other cues also might make it possible for receivers to detect which image was used unless the experimenter has two sets of images.

In a second kind of common parapsychology experiment, research subjects try mentally to influence machines that generate numbers randomly. In the usual version of these experiments, an electronic device generates a random series of zeroes and ones, and the subject of the experiment tries to push the string of numbers mentally either in the direction of more zeroes or more ones.

Mr. Radin, who has analyzed 597 random-number-generator experiments done by 68 researchers, says the results indicate that the random-number generators are somehow being influenced away from randomness.

"The statistics indicate that the results are so far away from chance that chance is not a possible explanation," he says. "I'm not saying it's something psychic, but there is some artifact there. And so far I haven't been able to find any normal artifact that might explain the results."

Once again, Mr. Hyman says the parapsychologists don't have enough proof that the random-number generators are really random, and without that proof he says the experiments are meaningless.

The parapsychologists also had some political quarrels with the National Research Council's report. They charged that the committee chairman had asked the author of a background paper commissioned for the report to withdraw his conclusion that the Ganzfeld experiments are methodologically sound.

The chairman, John A. Swets, chief scientist at Bolt Beranek and Newman, a Cambridge, Mass., consulting firm, says he did ask Robert Rosenthal, a professor of social psychology at Harvard University, if he would eliminate his conclusions

about the Ganzfeld experiments from his paper. Mr. Swets says the committee preferred its own analysis of the Ganzfeld experiments. "We thought the quality of our analysis was better, and we didn't see much point in putting out mixed signals," says Mr. Swets. "I didn't feel we were obliged to represent every point of view."

Mr. Rosenthal said he thought it was "inappropriate" of Mr. Swets to ask him and Monica J. Harris, a graduate student, to withdraw their conclusions about the Ganzfeld experiments. The conclusions were ultimately kept in the background paper but not included in the report.

Makeup of Committee Criticized

The parapsychologists also say the committee was unfairly stacked with avowed critics of parapsychology and should have had at least one parapsychologist on it.

Mr. Swets says the committee didn't have any members who were advocates for the performance-enhancement methods being evaluated. Mr. Hyman, who is a cognitive psychologist interested in the subject of human error, says he has written about parapsychology since the 1950's. "I'm one of the few critics who knows them, who reads their literature, and who goes to their conventions."

He says he is neutral. "I don't care about parapsychology," he says. "To me it's a very dull topic."

Even if parapsychologists discover the existence of special mental powers outside of what is now known, Mr. Hyman says he believes the powers will be so elusive and so subtle that they can't be controlled. If anything, he says, parapsychologists will only find a "cosmic hiccup."

Copies of the Parapsychological Association's critique, "Reply to the National Research Council Study on Parapsychology," are available for \$2 from the Parapsychological Association, P.O. Box 12236, Research Triangle Park, N.C. 27709.

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Policies on Scientific Misconduct

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fabrication of data, but sloppy research practices.

Despite the differences, six panels that met for two days came up with some specific recommendations for preventing misconduct and poor research practices. The panels recommended that universities have:

- Specific policies requiring scientists to keep data to support published papers and encouraging scientists to give the data to others who want to check their results.

- Guidelines for the heads of laboratories and the mentors of research trainees about their responsibilities to trainees. Such guidelines would make sure students and trainees knew who was supposed to be training them and whom they could turn to for help. Some training in the ethics of science and good research practices might also be required.

- Written policies making it clear that those who are not directly involved with research should not be named as the authors of scientific papers. The policies would end the practice in some laboratories of automatically making the head of a laboratory an author on every paper coming out of the laboratory.

Arnold S. Relman, editor of the *New England Journal of Medicine*, spoke in support of a larger role for the institutions where scientists are based. "Institutions have to take more of a role in making sure good

publication practices are followed," he said. "We editors cannot possibly investigate and insure the validity of every author's name on each paper."

An enhanced role for universities and other research institutions was not supported by everyone at the workshop.

Some scientists argued that the encouragement of good research practices should come from the laboratory itself, without outside interference by the university.

The Institute of Medicine workshop was intended to look at "gray areas" where blatant fraud is not involved but where research practices might still be questionable.

William Raub, deputy director of the National Institutes of Health, said much attention had been given to big scientific sins, such as plagiarism, but less attention had been given to the little sins—sloppy record-keeping, poor supervision of researchers, selective reporting of data, publishing the same data in many journals, and the use of the "least publishable unit."

That term refers to scientists who write papers the moment they have enough significant data, instead of waiting to confirm those data or expand on them.

"There is no apparent consensus on how bad these sins are, what the standards should be, or if there should be standards," said Mr. Raub.

—DAVID L. WHEELER